

IN THE CLAIMS

1. (Currently Amended) A device for producing a plasma (~~16~~) in a chamber comprising means for producing an energy in the microwave spectrum for the excitation of the plasma, said means comprising at least one basic plasma excitation device comprising a coaxial applicator (~~4~~) of microwave energy, of which one end is connected to a production source (~~7~~) of microwave energy, the other end (~~8~~) being directed to the gas to be excited within the chamber, ~~characterized in that wherein~~ each basic excitation device is arranged in the wall (~~3~~) of the chamber, each applicator (~~4~~) comprising a central core (~~5~~) which is substantially flush with the wall of the chamber, the central core and the thickness of the wall (~~3~~) of the chamber being separated by a space (~~6~~) coaxial with the central core, this space being completely filled at least at one end of each applicator with a dielectric material (~~14~~) such that said material is substantially flush with the level of the wall of the chamber.
2. (Currently Amended) The device as claimed in claim 1, ~~characterized in that wherein~~ the dielectric material (~~14~~) is refractory.
3. (Currently Amended) The device as claimed in claim 2, ~~characterized in that wherein~~ the dielectric material (~~14~~) is made of an alloy of silica and/or of aluminum nitride and/or of alumina.
4. (Currently Amended) The device as claimed in ~~one of claims 1 to 3~~ claim 1, ~~characterized in that wherein~~ the dielectric material fills the entire coaxial space (~~6~~).
5. (Currently Amended) The device as claimed in ~~one of claims 1 to 3~~ claim 1, ~~characterized in that wherein~~ the length of the dielectric material is equal to an integral number of half-wavelength of the microwaves in the dielectric material.
6. (Currently Amended) The device as claimed in ~~one of claims 1 to 5~~ claim 1, ~~characterized in that it comprises~~ further comprising o-rings (~~21~~) inserted between the dielectric (~~14~~), the central core of an applicator and the internal wall of the applicator.

7. (Currently Amended) The device as claimed in claim 6, ~~characterized in that wherein~~ each O-ring (24) is embedded in the internal and external walls of the coaxial structure.
8. (Currently Amended) The device as claimed in ~~one of claims 1 to 7~~ claim 1, ~~characterized in that wherein~~ a central core (5) terminates in a permanent magnet (22) encapsulated in the central core and flush with the walls of the chamber.
9. (Currently Amended) The device as claimed in ~~one of claims 1 to 8~~ claim 1, ~~characterized in that it comprises~~ further comprising a dielectric plate (20) that extends to the interior of the chamber on the internal wall thereof, said plate completely covering the plasma excitation devices.
10. (Currently Amended) The device as claimed in ~~one of claims 1 to 9~~ claim 1, ~~characterized in that it comprises~~ further comprising means (12) for cooling each applicator (4) in the chamber walls.
11. (Currently Amended) The device as claimed in ~~one of claims 1 to 10~~ claim 1, ~~characterized in that it comprises~~ further comprising means for cooling the applicators in the central core (5) of each applicator (4).
12. (Currently Amended) The device as claimed in ~~one of the preceding claims~~ claim 1, ~~characterized in that wherein~~ the pressure of the plasma (16) is between a value of about 1 millitorr and a value of about a few tens of torr.
13. (Currently Amended) The device as claimed in ~~one of the preceding claims~~ claim 1, ~~characterized in that it comprises~~ further comprising a plurality of applicators (4), the applicators being arranged in a two-dimensional network in the wall of the chamber in order to obtain the desired applicator density for a desired pressure range.